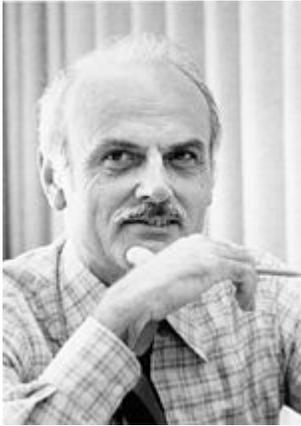


Edgar Frank Codd

Born August 19, 1923, Portland, UK; invented the first abstract model for database management, as a whole undertaking, including retrieval, manipulation, logical integrity constraints, views and view updatability, and the management of distributed databases with distribution independence; recipient of the 1981 ACM Turing Award.



Education: BA and MA, mathematics, Oxford University, 1948; PhD, communication sciences, University of Michigan, 1965.

Professional Experience: captain, Royal Air Force, 1942-1945; instructor, mathematics, University of Tennessee, 1949; IBM Corp.: mathematician/programmer, SSEC,¹⁶ 1949-1951, designer, IBM-701 and IBM-702, 1951-1952, designer, STRETCH (IBM-7030), 1957-1959, creator, STEM, 1957-1961, developer, Relational Database Model, 1970-1981, retired, 1984; Computing Devices of Canada, 1953-1957.

Honors and Awards: fellow, British Computer Society, 1974; fellow for life, IBM, 1976; Turing Award, ACM, 1981; member, National Academy of Engineering, 1983; fellow, American Academy of Arts and Sciences, 1994.

Codd joined IBM in June 1949 after a short stint at the University of Tennessee, and began his professional career in the computer industry as a mathematician and programmer for the SSEC¹ in New York City. As IBM moved into the computer field more solidly he worked on the logical designs of the IBM 701, initially named the “Defense Calculator,” and the IBM 702, which was the first machine designed for business use rather than scientific computations. After four years in Canada he returned to IBM at the time of the development of the STRETCH system (IBM 7030) and created the first multiprogrammed control system capable of managing the interleaved and concurrent execution of programs designed independently of each other-STEM.

On leave from IBM for four years, he completed his PhD at the University of Michigan and presented a thesis on the topic of a self reproducing computer consisting of a large number of simple identical cells, each of which interacts in a uniform manner with its four immediate neighbors. Codd reported this work in a book entitled *Cellular Automata* published by Academic Press in 1968.

Returning to IBM after the announcement of System/360, but at the beginning of the push for the development of a universal language which would match in software the basic concepts of the 360 line of hardware, he backed the IBM laboratory in Vienna (Zemanek, Lucas, et al. 1965) to create a formal definition of the language PL/I. This language became known as the Vienna Definition Language (VDL).

He began work in 1969 on the relational model for database management, a project which he continued to promulgate for the next 12 years within IBM, although the corporation was less than enthusiastic about the work. Eventually, in 1982, IBM announced the availability of SQL/DS, a database management system (DBMS) based on the relational model, intended for mid-size systems. The following year a system for large scale computer systems, DB2, also based on the relational model, was released.

¹Selective Sequence Electronic Computer.

Since retirement from IBM in 1984 at the age of 61, Codd has established two companies to provide world-wide lecturing and consulting services to vendors and users of database management systems, and continues to write technical papers in response to ill-conceived criticisms of the relational model.

In a private communication, Codd provided an outline of what he considered to be his 10 major technical contributions to the field:

- multiprogramming;
- self-reproducing computers;
- the relational model for database management, version 1;
- the Rendezvous project for the casual user of a Relational DBMS;
- the Tasmanian version of the Relational Model RM/T;
- a system for managing Bill-of-Materials applications;
- 12 rules for distinguishing RDBMS from non-relational DBMS;
- the relational model for database management, version 2;
- 12 rules for Repositories;
- developed the new model for DELTA for business specification and management.

BIBLIOGRAPHY

Significant Publications

- Codd, E. F., "Multiprogramming STRETCH: Feasibility Considerations," *Comm.ACM*, Vol. 2, No. 11, Nov. 1959, pp. 13-17.
- Codd, E. F., *Cellular Automata*, Academic Press, New York, 1968.
- Codd, E. F., "A Relational Model of Data for Large Shared Data Banks," *Comm. ACM*, Vol. 13, 1970, No. 6.
- Codd, E. F., "How about Recently?," Int'l. Conf. Databases: Improving Useability and Responsiveness, Haifa, Israel, August 2-3, 1978.
- Codd, E. F., "Extending the Relational Model to Capture More Meaning," (RM/T), *ACM Trans. Database Systems*, Vol. 4, No. 4, 1979.
- Codd, E. F., "Missing Information (Applicable and Inapplicable) in Relational Databases," *ACM SIGMOD Record*, Vol. 15, No. 4, 1986.
- Codd, E. F., "Relational Database: A Practical Foundation for Productivity," *Comm. ACM*, Vol. 25, No. 2, 1982.
- Codd, E. F., "More Commentary on Missing Information in Relational Databases," *ACM SIGMOD Record*, Vol. 16, No. 1, 1987.
- Codd, E. F., *The Relational Model for Database Management: Version 2*, Addison-Wesley Publ. Co., Reading, Mass., 1990.
- Codd, E. F., "DELTA: a Model for Business Specification and Management," available to software vendors from Codd under contract, 1991.

UPDATES

Ted Codd died April 18, 2003 (MRW, 2012)